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NEW ZEALAND ANTARCTIC RESEARCH PROGRAMME 1978-1979

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NEW ZEALAND ANTARCTIC RESEARCH PROGRAMME

PLANNING AND OPERATION

The Ross Dependency Research Committee formulates the New Zealand Antarctic Research Programme. The Committee comprises representatives of Divisions of the Department of Scientific and Industrial Research, the Lands and Survey, the Dominion Museum, the Royal Society of New Zealand, New Zealand Universities, the Chiefs of Staff of the New Zealand Armed Forces, and the Department of Foreign Affairs. It is representative of all scientific disciplines with Antarctic interests.

Antarctic Division, DSIR, is responsible for detailed planning and implements the programme. The Division employs staff and obtains supplies and equipment for all Government projects. University projects are financed and equipped from University sources. The operation and control of all projects is directed by the Antarctic Division through the Officer-in-Charge, Scott Base.

SCOTT BASE

Scott Base opened on January 20, 1957 as a scientific station in support of International Geophysical Year (IGY 1957-1958). The base also served as a staging point for the Commonwealth Trans-Antarctic Expedition of that year.

Sited at Pram Point on the southern tip of Ross Island, (latitude 77°50' S) Scott Base is only three kilometres from the main American base - McMurdo Station.

The number of base buildings has now increased from seven to eleven and all now are interconnected by covered ways. These allow free movement around the base without exposure to the weather, and the modular construction minimises the ever-present fire risk.

Eleven men will winter-over at Scott Base in 1979. The team will comprise: the O.I.C., base engineer, electrician, mechanic, postmaster, three technicians, scientific officer, cook and a field assistant.

In contrast base staff will double during the Summer and the summer programme including support and construction activities will involve more than 160 people.

A NEW SCOTT BASE

Over the last 22 years the original Scott Base buildings have been modified and reshaped to accommodate more equipment and people. However these changes have been insufficient to keep up with the expanding scientific programme.

Construction is now in progress and an outdated Scott Base is being re-built to create a base which will meet the needs of the New Zealand Antarctic Research Programme for the next 25 years.

The first phase of the re-building programme took place in 1976-77 when a new Bio-Lab was erected. In addition to a scientific laboratory this new two storey building houses a small lounge, the base library and has accommodation for 20 people (boosting bed numbers at the base to a total of 58).

Stage two of the re-building is to take place during the 1978-79 season. This will include the construction of a new power house. Two 135 KVA three phase Caterpillar Alternator units driven by Caterpillar 3306 engines will replace the current two 65 KVA generators and two auxillary 48 KVA generators. The new units will allow for greater loading.

The main building will be flown in during December and installed by an Army team. The heavy gear - generators and boilers will arrive in late January by sea and the plant should be operational prior to the last flight of the season on February 28.

An icemelter is to be installed on the outside of the powerhouse. The Cat 920 loader will be able to direct load the unit (previously the melters have been hand loaded) and melted water held in a 2000 gallon storage tank. Ultimately a desalination plant will be installed along with a pumphouse.

A large slab of concrete is to be laid in front of the hangar. Depending on the results the entire hangar floor may be eventually concreted. A hovercraft garage is to be built by Scott Base staff this season.

Landscaping and preparation of building pads for the next stages of reconstruction will be carried out this summer. Further upgrading and general maintenance will continue around the base.

TRANSPORT

Until 1960 air support within Antarctica was provided by the Antarctic Flight of the Royal New Zealand Air Force. Since then generous air support has been given by the VXE-6 squadron of the United States Naval Support Force under Government agreement. In return base facilities are granted the support force in Christchurch and N.Z. provides the U.S. with operational assistance - e.g. N.Z. Army cargo handling teams are stationed in Christchurch and in the Antarctic at Williams Field and McMurdo Station.

Twelve RNZAF Hercules flights will constitute the main New Zealand contribution to the U.S./N.Z. logistics pool this season. Additional flights will be provided early in the season for the transportation of building materials to allow Scott Base reconstruction to proceed during the summer months.

This season as in the past two RNZAF helicopter crews will be attached to the VXE-6 squadron flying field missions in Antarctica.

For the first time Australian Hercules aircraft will operate through Christchurch and contribute to the U.S./N.Z. pool under a tripartite agreement which will allow Australians to be air transported to Australian bases.

Ground Transport : Scott Base

1 Pindair Hovercraft
1 D4 Caterpillar tractor
1 920 Caterpillar tractor
4 Snowtric motor toboggans
4 O.M.C. snow cruiser toboggans
2 Landrovers
4 Snow tracs
1 Gnat
1 International tractor (crawler)
2 Dodge 4 wheel drive one ton trucks
2 Rupp 440 motor toboggan snow-mobiles
1 F250 Ford 4x4 crew cab - a new addition this year.

2 Dog teams - sledge dogs have been a feature of New Zealand field party transport since the Trans-Antarctic Expedition of 1957. However motor toboggans introduced into the 1962-63 season have made long dog sledge journerys unnecessary. The "tin dogs" can cover greater distances in shorter time and haul heavier loads. The dog pack at Scott Base is now kept at about 20 - enough for two teams of nine dogs each, plus a few spares. The main functions of the dog teams now are for emergency, recreation and public relations purposes.

Transport : Vanda Station

2 Ferguson tractors

RESEARCH ACTIVITIES

1. SCOTT BASE

Scott Base is an important link in the global chain of geophysical observing stations and main research is undertaken in:

Ionospherics

Scott Base is one station in a world network of stations which record continuously the state of the ionosphere with a vertical incidence recorder. A panoramic ionosonde, designed and constructed in New Zealand, sweeps from 1-22 megacycles in 24 seconds at 15 minute intervals to provide data from Scott Base to be used for the prediction of radio operation frequencies. A new addition to the established laboratory research programme this year is Ionospheric D-Region observation equipment. This will be installed at Scott Base during the coming summer for continuing observation and maintenance by the wintering over scientific staff. Ionospherics is under the aegis of the

Geophysical Observatory, Physics and Engineering Laboratory, DSIR, Christchurch.

Geomagnetism

In this standard observatory activity, two independent recording systems are used:

(a) Wide Range three-component instrument.
(b) Quick Run three-component instrument.

Both instruments have La Cour magnetographs. Weekly absolute observations are also being made with the aid of a proton precession magnetometer. Geomagnetism is under the aegis of the Geophysical Observatory, P.E.L., DSIR, Christchurch.

Earth Currents

During the 1964-65 season a programme measuring electric currents in the earth was established at Scott Base, as this year was the International Year of the Quiet Sun. Solar flares then reached a minimum as compared with the International Geophysical Year in 1957-58. Two sets of electrodes sunk 10 ft. deep through the permafrost were spaced 4,000 ft. apart, one for the north-south reading and one for the east-west reading. This electric current study, which results from variations in the earth's magnetic field, is one method of observing solar and ionospheric activity which has important effects on radio communication. Although earth current observations ceased in October 1974, one line which acts as an indicator of disturbance was retained to monitor magnetic activity. This programme is under the aegis of the Geophysical Observatory, P.E.L., DSIR, Christchurch.

Infrasonic Wave Recording

During the 1976-77 season infrasonic wave recording equipment and telemetry receivers were installed at Windless Bight by the Geophysical Institute of the University of Alaska. The purpose of this infrasonic array is to study auroral infrasonic waves in Antarctica at high geomagnetic latitude.

Seismology

Sited on rock and located near to Antarctica's major mountain chain extending from Cape Adare to beyond the Beardmore Glacier southward, Scott Base is of strategic importance in Antarctic seismology. Additions made to the science laboratory in 1962-63 permitted the setting up of new American equipment, one of 120 identical equipments which the United States Coast and Geodetic Survey has given to countries throughout the world. New Zealand is responsible for three other such stations: Wellington, New Zealand; Rarotonga, Cook Islands and Apia, Samoa.

Seismology is under the aegis of the Seismological Observatory, Geophysics Division, DSIR, Wellington.

Seismic recorders are to be installed at various positions around the base of Mt Erebus. Dr Philip Kyle of Ohio State University is leading this programme.

Meteorology

Routine daily climatological and surface synoptic observations, recording solar radiation, ozone and atmospheric turbidity measurements.

From November 1, 1978 the meteorological programme at the U.S. South Pole Station will be resumed by the U.S. Navy. This will end three years, during which the N.Z. Meteorological Service has carried out the entire meteorological programme at the South Pole.

The N.Z. Meteorological Service will henceforth up-date the Scott Base observing programme by making additional radiation measurements including some data analysis and in conjunction with U.S. observers at McMurdo obtain data on relationship between Antarctic circulation and changes in atmospheric circulation over N.Z.

More extensive weather observations will also be carried out at Vanda for use in the First GARP Global Experiment (January - February 1979).

2. ARRIVAL HEIGHTS

Auroral Physics

New Zealand is uniquely situated for the study of aurora. With stations at South Pole, Scott Base, Campbell Island, Invercargill, Lauder (Central Otago), Christchurch and Wellington there is a north-south line of observing points which transects the auroral zone ringing the Antarctic Continent. At these points there are various scientific tools for the auroral research programme, which is conducted by the New Zealand Physics and Engineering Laboratory. At Arrival Heights, a key station in the programme, a special auroral hut houses all-sky cameras. A complex programme operates during the hours of darkness.

Micropulsation

A programme commenced by ESSA Boulder, U.S.A., the equipment was resited in December 1970 and the programme is now operated jointly by ESSA and Geophysical Observatory, P.E.L. technicians. The programme records minute fluctuations of the earth's magnetic field caused by disturbances in the ionosphere.

Riometer (Relative Ionospheric Opacity Meter)

This equipment which continuously records ionospheric absorption was installed with the co-operation of the National Science Foundation in 1974-75 and is operated by the Scott Base staff. The original machine was removed in September 1975 and was replaced by two new Riometers.

(Note: On request the base scientific staff will readily supply details of all equipment).

3. CAPE ROYDS

A combined biological laboratory and sleeping hut was erected in 1963 by Scott Base staff at Cape Royds, 36 km north of Scott Base on the western side of Ross Island.

This is the location of the most southerly Adelie penguin colony in the world. The rookery has been designated by SCAR and the Treaty Nations as a "Site of Special Scientific Interest".

Biologists from Canterbury University used the hut at Cape Royds for several summer seasons as headquarters for their studies on penguins, skuas and seals.

The hut has since been transported to the Wright Valley and integrated into the buildings of Vanda Station.

A smaller summer hut has been erected at Royds for visiting researchers.

4. CAPE BIRD

Bird Station was constructed by Scott Base personnel during the 1965-66 season. Following completion of studies on wildlife at Cape Royds, the Canterbury University Antarctic Biological Unit commenced a programme of study on seals, Adelie penguins, McCormick skua gulls and their inter-relationships.

In the summer of 1971-72 a wet laboratory was built to facilitate the study of marine plankton. Benthic research is also carried out.

5. VANDA STATION

New Zealand's only base on the Antarctic Continent was built in 1968 to support the intensified study of the almost ice-free Dry Valleys. Vanda Station, 130 km west of Scott Base, is ideally situated for the support of summer field parties working in the Dry Valley area.

Vanda is basically a summer only station but scientific parties wintered over in 1969, 1970 and 1974. Research programmes were carried out in the fields of meteorology, seismology, aurora, upper air physics, geomagnetism and human physiology.

This year Vanda will again operate for the summer only. A N.Z. meteorological technician will make a comprehensive set of weather observations for use in the first GARP Global Experiment (January - February 1979).

The station will continue to play its vital logistic, support and communications role for NZARP parties operating in the Dry Valleys.

FIELD EVENTS 1978-79

Government field parties will continue to implement research programmes in glaciology, geology, vulcanology, marine biology and undertake geophysical and topographical surveys in the 1978-79 season.

New Zealand universities will carry out a number of field research projects, collectively covering biology, vulcanology, glaciology, geology, geochemistry, geomorphology and psychology.

New Zealand will provide support for and participate in a number of international programmes which will include Australia, United States, Japan, France and Poland.

EVENT 1 : GLACIOLOGY AND HYDROLOGY

MOWD hydrologists will continue a monitoring programme carried out over past seasons documenting both long and short term climatic variations in the Dry Valley area. They will also study the flow regime on the Onyx River. This season it is proposed to increase the scope of the programme to cover a full field season to enable a 5 yearly photo theodolite survey to be repeated on a number of selected glacier margins. At the same time a large reduction has been made in the number of glacier balance measurements.

EVENT 2 : MARIE BYRD LAND GEOLOGICAL EXPEDITION

The N.Z. Geological Survey is sponsoring a comparitive study of the geology of the Southern Edsel Ford Range in Western Marie Byrd Land with southern and western New Zealand.

EVENT 3 : SURVEY WORK

Two surveyors from Lands and Survey/DSIR will carry out a wide variety of survey projects this season. These range from survey work connected with the rebuilding of Scott Base, to mapping projects around Ross Island and a level traverse in the Lower Taylor Valley.

EVENT 4 : CARBON DIOXIDE COLLECTION - SCOTT BASE

Scott Base staff will continue the year-round monitoring of the carbon 14 content of atmospheric carbon dioxide. The New Zealand programme includes eight sampling stations from the equator to Scott Base. This data collection has allowed calculations of the rate of atmospheric mixing which transports nuclear bomb produced radiocarbon around the world.

EVENT 5 : MT EREBUS OBSERVATIONS

A small international team will carry out magnetic, seismic and visual observations around the summit craters of Mt Erebus.

An acclimatisation camp will again be established at the Fang Glacier. There is a possibility that the USARP will aid the project by erecting a small Jamesway hut on the summit of Erebus. French volcanologist, Haroun Tazieff may again lead the event this summer.

EVENT 6 : AEROMAGNETIC SURVEY OF MARIE BYRD LAND

International project cancelled.

EVENTS 7 & 8 : ROSS ICE SHELF PROJECT

The Ross Ice Shelf Project (RISP) is an international venture aimed at studying the physical, chemical, biological and geographical condition in and beneath the Ross Ice Shelf.

Members of the N.Z. Oceanographic Institute/DSIR plan to re-visit the J9 RISP hole which was drilled last season. They will continue their work on temperature profile studies (Ev. 7) and on Pelagic Copepods and Benthic Echinoderms (Ev. 8).

EVENT 9 : PROPERTIES OF ANTARCTIC ICE USING PHYSICAL METALLURGY TECHNIQUES

DSIR Physics and Engineering staff are working on the physical properties of single crystal ice with a view to determining the electrical charge on dislocations on ice.

They will look at hardness and in particular the hardness stress-strain curve as these properties give a good measure of plasticity and therefore a guide to the resistance to flow of glaciers.

Ice will be looked at on: Lake Vanda, The Clark, Canada, Commonwealth and Taylor Glaciers and on the Erebus ice tongue.

EVENT 10 : SEISMIC SURVEY - LOWER TAYLOR VALLEY

The Geophysics Division/DSIR and University of Northern Illinois plan to carry out a seismic survey of the Lower Taylor Valley and to define the basement topography in the Lower Taylor Valley and if possible link sedimentary layers between DVDP drill sites.

Subject to available ship time a seismic profile along the mainland coast between New Harbour and Marble Point will be attempted. A seismic profile between Cape Bird and Terra Nova Bay is also planned.

EVENT 11 : McMURDO SOUND SEDIMENT AND TECTONIC STUDIES

A team of two will visit Scott Base and McMurdo Station to check out the condition and operation of the DVDP drill rig.

Several of the 1978 wintering crew will survey conditions between Scott Base and Marble Point.

EVENT 12 : GLACIAL SEDIMENT STUDIES

Mr Paul Robinson of Victoria University will continue his field investigation of the Taylor Glacier including the final measurements of stakes for ice movement and ablation.

A search will be made in the Dry Valleys and along the coast between the Koettlitz and MacKay Glaciers for other similar layers of basal debris.

EVENT 13 : BEACON SEDIMENT STUDIES

A detailed sedimentiological study of the Weller Coal Measures will be started and coal in the strata at the heads of the Dry Valleys assessed.

Samples will be collected from both the Devonian and Permo-Triassic Beacon for paleomagnetic measurements to establish a polar wander curve for south Victoria Land. This is a joint project between Victoria University and Mr Don Elston of the U.S. Geological Survey of Arizona.

EVENT 14 : BIOLOGICAL STUDIES CAPE BIRD

The University of Canterbury Zoology Department will again undertake the annual penguin and skua census at Cape Bird.

Mr G. Wilson (Canterbury University) will continue studies of killer whales and Dr F. Austin (Otago University) will investigate Adelie penguins and skuas for evidence of past or present infection with influenza viruses.

Hut and equipment maintenance will also be carried out.

EVENT 15 : SALINE LAKE GEOCHEMISTRY

Further geochemical studies in Lakes Bonney, Vanda and Fryxell will be undertaken by the Chemistry Department of Waikato University.

EVENT 16 : GEOMORPHOLOGY IN DARWIN MOUNTAINS

Antarctic Division/DSIR and Waikato and Victoria Universities plan to combine with a USARP project led by Professor G. Denton of the University of Maine.

The team will undertake geochemistry and geomorphology studies in the Darwin Mountains, Brown Hills and Tentacle Ridge area.

EVENT 17 : PSYCHOLOGICAL STUDIES

Professor Tony Taylor of Victoria University plans to continue gathering psychometric data from Scott Base wintering personnel.

EVENT 18 : PARASITOLOGY

Cancelled.

EVENT 19 : WHITE ISLAND SEAL STUDIES

Mr Tas Carryer of Canterbury University will go south on Winfly and with a member of the 1978 wintering crew visit White Island for one week.

Using hydrophones through a hole in the ice they will attempt to prove whether the Weddell seal population winters in isolation at White Island.

Two insulated wannigans are to be transported to White Island in September and maintained throughout the season.

A continuing study of seal movements and numbers around the island will take place. The study of food chain dynamics of the under-ice ecosystem and studies in the primary productivity and seasonal succession of the tide-crack community will continue.

EVENT 20 : ALUMINIUM CORROSION

A study of corrosion on exposed aluminium strips will continue to be carried out by Scott Base staff on behalf of Canterbury University.

Annually these plates are returned to Christchurch for analysis and direct comparison is made with other plates exposed at various industrial locations in New Zealand.

EVENT 21 : EYES AND VISION OF ANTARCTIC ANIMALS

A continuation of studies begun in the 1977-78 season by the University of Waikato. Fish and crustacean photoreceptor structure and function will be looked at. This year particular attention will be given to colour sensitivity.

EVENT 22 : PHYSIOLOGICAL ADAPTATION OF POIKILOTHERMS

As is in 1977 the 1978-79 programme will consist of two separate physiological projects; one on neurophysiological adaptations (Dr J. McDonald, University of Auckland) and the second on haematological adaptations in oxygen transport.

EVENT 23 : COASTAL MORPHOLOGY - CAPE ADARE

Cancelled.

EVENT 24 : SURVIVAL TRAINING

A continuation of survival training provided for USARP/NZARP personnel by Antarctic Division/DSIR.

EVENT 25 : HISTORIC HUT RESTORATION - CAPE ADARE

Cancelled.

EVENT 26 : WORKER VISITORS

Up to 30 worker visitors from various Government Departments will visit Scott Base during the season, servicing various installations, lab programmes or assisting in the constructing of Scott Base.

EVENT 27 : JAPANESE ANTARCTIC RESEARCH EXPEDITION

Veteran geochemist, Dr Tetsuya Torii will be spending his 12th summer season carrying out geological and geochemical research in the Dry Valleys.

EVENT 28 : NATIONAL FILM UNIT

A film unit will visit Scott Base and NZARP field parties with a view of producing a documentary on current NZARP activities.

EVENT 29 : DSIR ANTARCTIC DIVISION WORKERS

Several staff members will visit Scott Base and field parties to assist with logistic and administrative functions.

EVENT 30 : PENGUIN CENSUS - CAPE ROYDS

As Cape Royds had been designated a Site of Special Scientific Interest, New Zealand is required to provide annual reports to SCAR and Treaty Nations on observations, census figures etc. Scott Base staff will again undertake the census.

EVENT 31 : SEAL CENSUS McMURDO SOUND

A continuation of the Weddell seal population census in the Scott Base to Cape Royds region is to be carried out again by Scott Base staff.

EVENT 32 : HISTORIC HUT CARETAKERS

Two members of the New Zealand Antarctic Society will visit Hut Point, Cape Royds and Cape Evans historic huts to continue restoration and maintenance.

EVENT 33 : VIP VISIT

Two groups of six will visit Scott Base and Vanda Station during the 1978-79 season under the guidance of the Superintendent and the Executive Officer, Antarctic Division.

EVENT 34 : YOUTH GROUPS VISIT TO SCOTT BASE

A youth from Boys Brigade, St John Ambulance and the Boy Scout Association will sail in a U.S. Coastguard Icebreaker to McMurdo Sound. The three will take part in duties around Scott Base for about one month.

EVENT 35 : SOIL NITRATE SALT STUDIES IN DARWIN MOUNTAINS - INTERNATIONAL PROJECT

Two Soil Bureau scientists hope to join Dr G. Denton's (University of Maine) USARP Geomorphology group. They plan to look at nitrate salts in soil formations found on some of the nunataks at the head of the Darwin Glacier. This will assist their hypotheses on the origin and formation of these salts in other Antarctic locations.

HISTORIC HUT RESTORATION

On Ross Island there are three historic huts which since 1960 have been excavated and restored to an "as was" condition by New Zealand Antarctic Society volunteers and DSIR personnel, with American assistance. In 1960-61 the hut at Cape Evans, which was Captain Scott's headquarters for his last tragic expedition in 1910-13, and was the home for the Ross Sea component of Shackleton's Trans-Antarctic Expedition of 1914-17, was restored. Also the hut at Cape Royds, which was Shackleton's headquarters for his 1907-09 expedition, was made weatherproof during the 1960-61 season. Finally, in the 1963-64 season, restoration work was commenced on Scott's 1901-04 expedition hut at Hut Point. Maintenance and restorative work is still carried out annually by New Zealand Antarctic Society volunteers.

At Cape Adare, at the northern tip of Victoria Land, are the two huts built by C.E. Borchgrevink in 1898-99 and the remains of Scott's Northern Party's hut of 1911. Scott's hut is beyond repair, but it is hoped that Borchgrevink huts will be restored at some time in the future.

REPORT OF NEW ZEALAND ANTARCTIC RESEARCH PROGRAMME FOR 1977-78 SUMMER AND 1978 WINTER

SCOTT BASE AND ARRIVAL HEIGHTS

At Scott Base scientific programmes continued in the fields of ionospheric physics, geomagnetism, meteorology, seismology, earth currents and atmospheric potential gradient. Arrival Heights maintained studies in auroral physics, micropulsations and ionospheric absorption.

Eleven men are spending the 1978 winter at Scott Base in support of the continuous scientific programme. This is the 22nd New Zealand wintering party.

Two New Zealanders are also wintering over at the Scott Amundsen South Pole Station as meteorological observers.

VANDA STATION

Now a summer only base, Vanda was manned this season by three men throughout the season. A limited weather programme was carried out and elementary hydrology and glaciology measurements made in the immediate area. Vanda operated from October 27 to January 27.

EVENT 1 : GLACIOLOGY, HYDROLOGY AND McMURDO ICE SHELF MOVEMENT STUDIES

A programme of monitoring selected Dry Valley glaciers, the flow of the Onyx River and the levels of Lake Vanda and other major Dry Valley lakes was continued by hydrologists of the Ministry of Works and Development. The movement of the McMurdo Ice Shelf was also monitored.

EVENT 2 : NEW ZEALAND GEOLOGICAL SURVEY GEOLOGICAL MAPPING

A four man field party, led by David Skinner of the N.Z. Geological Survey carried out detailed geological investigations and mapping in a region between the Foster and Blue Glaciers, about 90 miles southeast of Scott Base.

EVENT 3 : DSIR SOIL BUREAU - DRY VALLEY SOIL STUDIES

A study of old weathered soils in the Wright and Taylor Valleys and the Asgard Range region was undertaken by four DSIR soil scientists.

EVENT 4 : ATMOSPHERIC CO_2 SAMPLING

A continuing study involving the year-round collection of atmospheric CO_2 by the Scott Base laboratory staff.

EVENT 5 : MT EREBUS VOLCANOLOGICAL STUDIES

An international expedition, led by French volcanologist Haroun Tazieff, which continued geochemical, geophysical and geology studies on the summit of Mt Erebus. Efforts to obtain volcanic gas and lava samples were again unsuccessful but valuable isotopic analysis of snow and ice layers and mapping of warm ground areas were carried out.

EVENT 6 : AEROMAGNETIC SURVEY OF MARIE BYRD LAND

Cancelled.

EVENT 7 : ROSS ICE SHELF PROJECT

New Zealand is one of several nations involved in the R.I.S.P. Of interest are the physical, chemical, biological and geological conditions beneath the Ross Ice Shelf. A drill hole bored 420 metres through the ice shelf to give access to the water beneath, produced a "dirty" hole but however many aspects of the project were successfully completed.

EVENT 8A : ROSS ICE SHELF PROJECT

Mr P. Anderson of the N.Z. Oceanographic Institute carried out a series of benthic biota studies on the sea floor under the Ross Ice Shelf.

EVENT 8B : ROSS ICE SHELF

Dr Janet Bradford of the N.Z. Oceanographic Institute studied Pelagic Copepods (plankton) found under the Ross Ice Shelf. Working with American scientist, Dr J. Oliver they continued studies of the recently discovered microscopic epontic animals living at the ice-water interface.

EVENT 9 : OCEANOGRAPHY IN McMURDO SOUND - SESTON TESTING

Two science technicians from the N.Z. Oceanographic Institute undertook studies to determine the composition and transport dynamics of suspended and bedload sediment beneath the seasonal ice of McMurdo Sound.

EVENT 10 : GRAVITY SURVEY TAYLOR VALLEY

Three scientists from the DSIR Geophysics Division carried out a gravity survey across the mouth of the Taylor Valley at New Harbour and across the valley near Lake Fryxell. The purpose of the survey was to trace bedrock profiles tying in with the Dry Valley drilling project boreholes.

EVENT 11 : SOUTH POLE METEOROLOGICAL PROGRAMME

A three-year New Zealand meteorological programme at the United States South Pole Station will be completed at the end of the 1978 winter season. Surface synoptic, radiosonde and weather observations have been an important part of the programme.

EVENT 12 : GLACIAL STUDIES IN THE TAYLOR VALLEY

Mr Paul Robinson of Victoria University continued an investigation into the origin of the basal debris layer and present and past modes of glacier and debris movement in the Taylor Valley.

EVENT 13 : GEOCHEMICAL STUDIES IN McMURDO SOUND AND THE DRY VALLEYS

Dr J. Johnston of Victoria University and two assistants investigated the physical and chemical weathering processes of the lavas between Hut Point and Cape Royds and the bedrock and soils of the Taylor and Lower Wright Dry Glaciers - using Mossbauer spectroscopy.

EVENT 14 : BIOLOGICAL STUDIES - CAPE BIRD

The population and behavioural studies of Adelie penguins and McCormick skuas at Cape Bird continued last season. Mapping of territories was carried out. Band recoveries and the annual census were undertaken. An Israeli scientist Dr Yom Tov joined three Canterbury University students to study the effect of interference on penguin breeding success.

EVENT 15 : GEOCHEMISTRY - DRY VALLEYS

Six Waikato University students continued their geochemical studies in the Dry Valley system. These included studies of tin and uranium isotope ratios in the permafrost stream waters sediment studies on the lakes and studies of Antarctic peat deposits.

EVENT 16 : GEOCHEMISTRY - VOSTOK STATION

Professor Wilson and Dr Hendy visited the Russian station to carry out geochemical and isotope geochemistry of snow samples with a view to determining the origin of the Antarctic ice sheet. They carried out similar studies on ice cores taken from a drill hole at Vostok - at the 950 m level the ice core proved to be 51,000 years old.

EVENT 17 : PSYCHOLOGICAL STUDIES - SCOTT BASE

Professor Taylor of Victoria University continued his psychological and physiological studies of the Scott Base wintering over party.

EVENT 18 : PARASITOLOGY

Dr Featherston and two Otago University students continued parasitological studies of Weddell seals and McMurdo sound fish in the vicinity of Scott Base.

EVENT 19 : WHITE ISLAND SEAL STUDIES

Cancelled.

EVENT 20 : ALUMINIUM CORROSION

A study of corrosion of exposed aluminium strips was carried out by Scott Base staff on behalf of Canterbury University, who are continuing atmospheric corrosion research.

EVENT 21 : MICROBIOLOGY

Microbiological studies of Antarctic soil, water and ice took place in McMurdo Sound, the Dry Valleys and Cape Royds as part of a New Zealand Health Department distribution study of the amoeba which cause "hot pool" meningitis.

EVENT 22 :POIKILOTHERM STUDIES - SCOTT BASE AREA

Two Auckland University scientists studied the metabolic adaptations of polar fishes and invertebrates to constant low temperatures. The study focussed on two key physiological processes - the conduction of the nervous impulse and the transport of oxygen by the blood.

EVENT 23 : FIELD MILL PROJECT

Cancelled.

EVENT 24 : SURVIVAL TRAINING - SCOTT BASE

Three Antarctic Division field assistants provided courses in basic snow craft and survival techniques for NZARP personnel as well as USARP and U.S. Air and RNZAF physical training instructors and one RNZAF medical corpsman were attached to this event for several weeks.

EVENT 25 : GEOLOGICAL STUDIES - UPPER TAYLOR GLACIER

Three scientist from Victoria University studied the Perminan Glacial deposits in the Kennar Valley area of the Upper Taylor Glacier and examined the post-depositional changes in these and other sedimentary rocks of the Beacon sandstone.

EVENT 26 : WORKER VISITORS

Thirty-six worker visitors from various organisations visited Scott Base during the season - including a construction team working on the new Bio Lab.

EVENT 27 : JAPANESE ANTARCTIC RESEARCH EXPEDITION

A geochemistry team led by Dr Tetsuya Torii continued their research in the Dry Valley area.

EVENT 28 : T.V. TEAM

A four man T.V. team spent two weeks making a short documentary and news items on various aspects of NZARP activities.

EVENT 29 : DSIR WORKER VISITORS

Several staff members of Antarctic Division visited Scott Base, Vanda and various field parties during the season to assist with operations and administration.

EVENT 30 : ADELIE PENGUIN POPULATION STUDIES

The annual census of the Cape Royds penguin rookery was again undertaken.

EVENT 31 : SEAL CENSUS - McMURDO SOUND

Scott Base staff carried out the yearly population census in the McMurdo Sound/Ross Island region.

EVENT 32 : HISTORIC HUT CARETAKERS

Four members of the New Zealand Antarctic Society visited Hut Point, Cape Royds and Cape Evans historic huts to continue restoration and maintenance. An inventory and pictorial record of historic items contained in the huts was made for the Canterbury Museum Records.

EVENT 33 : NEWS MEDIA VISIT

Cancelled.

EVENT 34 : YOUTH ORGANISATIONS

A Scout, St John and Boys Brigade representative each spent a month at Scott Base - travelling there and back by U.S. Icebreaker.

EVENT 35 : VIP VISITS

Three groups of V.I.P.'s visited Scott Base and Vanda Station during the season, accompanied by the Superintendent and the Executive Officer of the Division.

EVENT 36 : MEDICAL RESEARCH

Dr A. Young spent one month at Scott Base investigating the physiological responses of people to different types of clothing insulation and the effectiveness of clothing used in Antarctica.

EVENT 37 : AUSTRALIAN LOGISTIC SUPPORT

Members of the Australian Antarctic Division and RAAF examined the feasibility of assisting DSIR with logistic support in future Antarctic programmes.

EVENT 38 : GEOLOGICAL EXPEDITION TO MARIE BYRD LAND

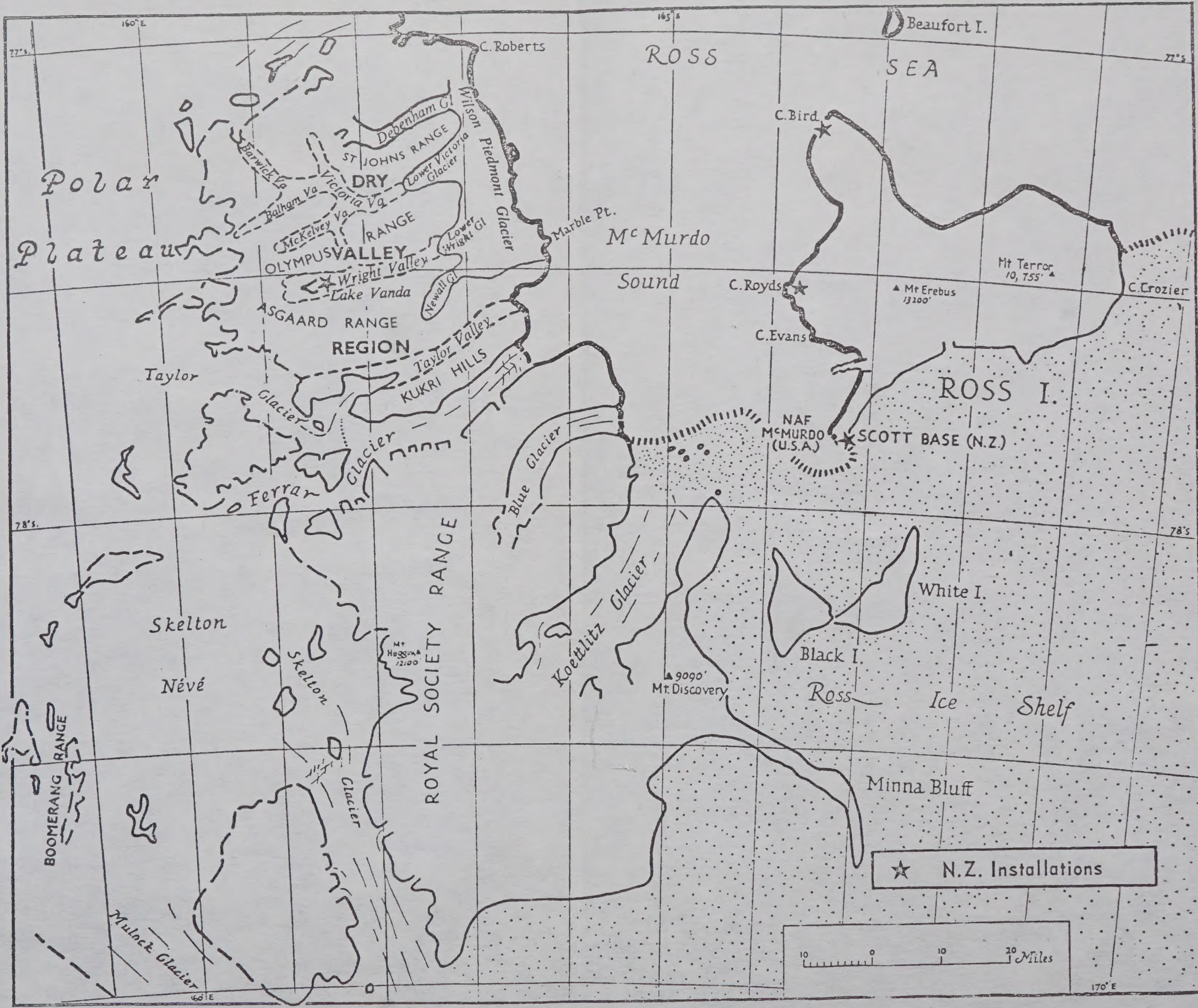
Dr G. Grindley of the Geological Survey DSIR worked with an American geological party in Marie Byrd Land.

THE FUTURE

The New Zealand Government's policy of continuing its Antarctic activities at approximately the same level is likely to continue for some time to come.

Scott Base is an integral part of the chain of international stations that provides global monitoring of many important disciplines in earth and atmospheric sciences and New Zealand is fully committed to continuing to implement these programmes.

As a result of Recommendation made recently at Antarctic Treaty Consultative Meetings, future summer field programmes are likely to shift in emphasis to implementing scientific programmes that should provide information on the possible presence of mineral resources in the Antarctic. Increasing attention is also likely to be given to the study of the complete marine eco-system of the Antarctic, its marine living resources, and the question of possible exploitation of fish and krill.



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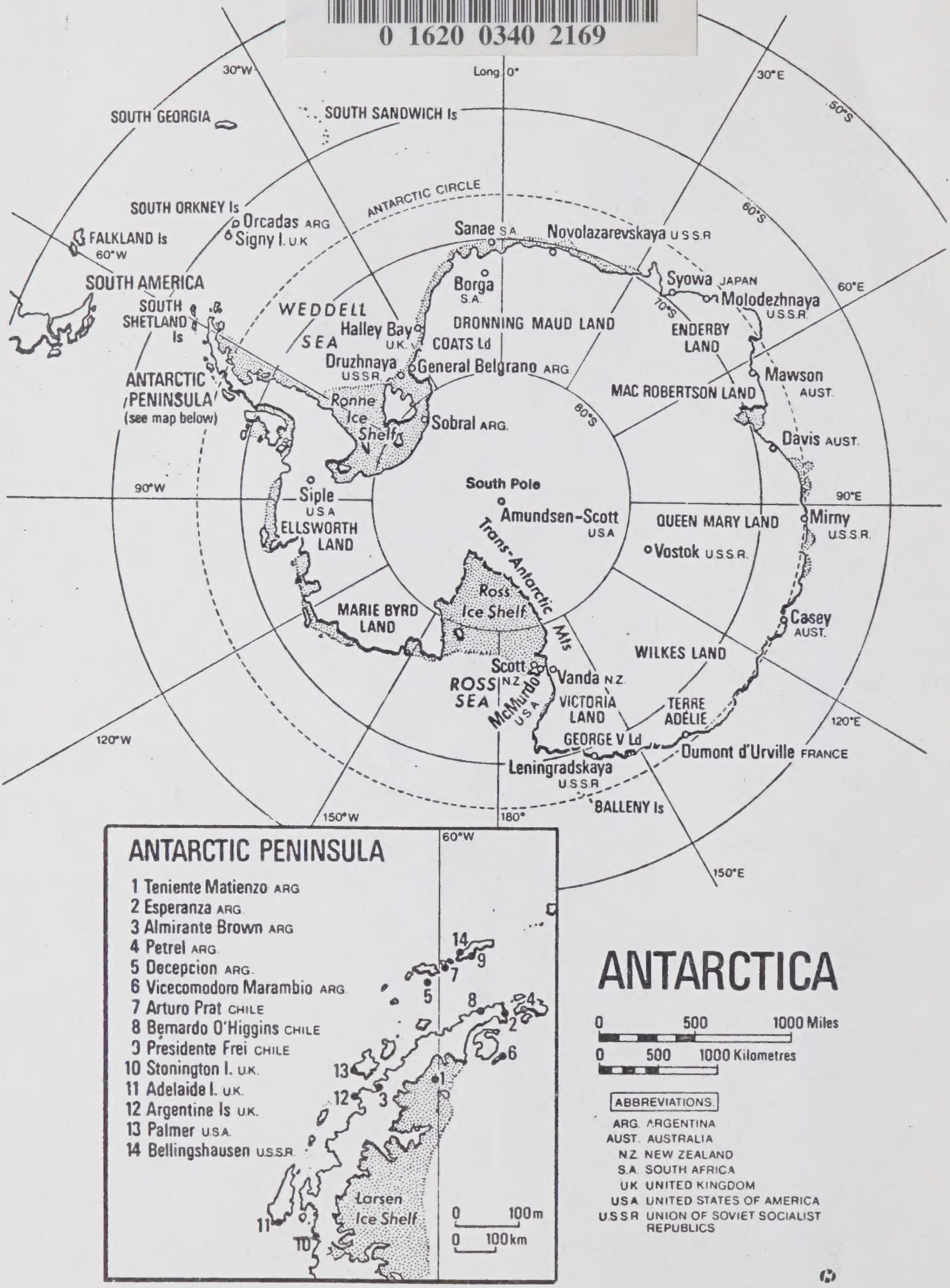

ANTARCTICA Selected Stations and Physical Features

MAP PREPARED BY N.Z. ANTARCTIC SOCIETY